

representing a gesture based on the relative positions of the clusters of touch points and to execute a command associated with said gesture.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] Embodiments will now be described more fully with reference to the accompanying drawings in which:

[0013] FIG. 1 is a block diagram of an interactive input system employing two imaging devices;

[0014] FIG. 2 is a block diagram of one of the imaging devices forming part of the interactive input system of FIG. 1;

[0015] FIG. 3 is a block diagram of a master controller forming part of the interactive input system of FIG. 1;

[0016] FIG. 4 is an exemplary view showing the sight lines of the imaging devices of the interactive input system of FIG. 1 when two pointers are in the fields of view of the imaging devices as well as real and imaginary pointer location triangulation solutions;

[0017] FIG. 5 is another exemplary view showing the sight lines of the imaging devices of the interactive input system of FIG. 1 when two pointers are in the fields of view of the imaging devices;

[0018] FIG. 6A is an exemplary view of a gesture made using two pointers interacting with the display surface of the interactive input system of FIG. 1;

[0019] FIG. 6B is an exemplary view showing the real and imaginary pointer location triangulation solutions during input of the gesture of FIG. 6A;

[0020] FIG. 7A is an exemplary view of another gesture made using two pointers interacting with the display surface of the interactive input system of FIG. 1;

[0021] FIG. 7B is an exemplary view showing the real and imaginary pointer location triangulation solutions during input of the gesture of FIG. 7A;

[0022] FIG. 8A is an exemplary view of yet another gesture made using two pointers interacting with the display surface of the interactive input system of FIG. 1;

[0023] FIG. 8B is an exemplary view showing the real and imaginary pointer location triangulation solutions during input of the gesture of FIG. 8A;

[0024] FIG. 9A is an exemplary view of yet another gesture made using two pointers interacting with the display surface of the interactive input system of FIG. 1;

[0025] FIG. 9B is an exemplary view showing the real and imaginary pointer location triangulation solutions during input of the gesture of FIG. 9A;

[0026] FIG. 10A is an exemplary view of a gesture made using an entire hand interacting with the display surface of the interactive input system of FIG. 1;

[0027] FIG. 10B is an exemplary view showing the touch region of the hand palm down on the display surface during input of the gesture of FIG. 10A;

[0028] FIG. 10C is an exemplary view showing the touch regions of the hand palm up on the display surface during input of the gesture of FIG. 10A;

[0029] FIG. 11A is an exemplary view of another gesture made using two hands interacting with the display surface of the interactive input system of FIG. 1;

[0030] FIG. 11B is an exemplary view showing the touch region of the hand palm down on the display surface during input of the gesture of FIG. 11A;

[0031] FIG. 11C is an exemplary view showing the touch region of the hand palm up on the display surface during input of the gesture of FIG. 11A;

[0032] FIG. 12A is an exemplary view of yet another gesture made using two hands interacting with the display surface of the interactive input system of FIG. 1;

[0033] FIG. 12B is an exemplary view showing the touch region of the hand palm down on the display surface during input of the gesture of FIG. 12A;

[0034] FIG. 12C is an exemplary view showing the touch region of the hand palm up on the display surface during input of the gesture of FIG. 10A;

[0035] FIGS. 13A, 13B and 13C combine to form a flowchart depicting a classification routine executed by the master controller of FIG. 3;

[0036] FIG. 14 is a flowchart depicting a hand gesture classification routine executed by the master controller of FIG. 3;

[0037] FIG. 15 is a flowchart of a left-click gesture routine executed by the master controller of FIG. 3;

[0038] FIG. 16 is a flowchart of a right-click gesture routine executed by the master controller of FIG. 3;

[0039] FIG. 17 is a flowchart of a drag gesture routine executed by the master controller of FIG. 3;

[0040] FIG. 18 is a flowchart of a pan gesture routine executed by the master controller of FIG. 3;

[0041] FIG. 19 is a flowchart of a zoom gesture routine executed by the master controller of FIG. 3;

[0042] FIG. 20 is a flowchart of a rotate gesture routine executed by the master controller of FIG. 3;

[0043] FIG. 21 is a flowchart of a hand swipe gesture routine executed by the master controller of FIG. 3;

[0044] FIG. 22 is a flowchart of a hand zoom gesture routine executed by the master controller of FIG. 3;

[0045] FIG. 23 is a flowchart of a hand pan gesture routine executed by the master controller of FIG. 3;

[0046] FIG. 24 is a flowchart of a pointer detection threshold process performed by the master controller of FIG. 3;

[0047] FIG. 25 is a perspective view of an interactive input system employing frustrated total internal reflection;

[0048] FIG. 26 is a side sectional view of the interactive input system of FIG. 25;

[0049] FIG. 27 is a sectional view of a table top and touch panel forming part of the interactive input system of FIG. 25;

[0050] FIG. 28 is a side sectional view of the touch panel of FIG. 27, having been contacted by a pointer;

[0051] FIG. 29 is a block diagram depicting an alternative pointer detection threshold process performed by the interactive input system of FIG. 25; and

[0052] FIG. 30 is a block diagram depicting the pointer contact pressure estimation system.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0053] Turning now to FIG. 1, an interactive input system that allows a user to inject input such as digital ink, mouse events etc. into an application program is shown and is generally identified by reference numeral 20. In this embodiment, interactive input system 20 comprises an assembly 22 that engages a display unit (not shown) such as for example, a plasma television, a liquid crystal display (LCD) device, a flat panel display device, a cathode ray tube (CRT) monitor etc. and surrounds the display surface 24 of the display unit. The assembly 22 comprises an illuminated bezel 26 surrounding the display surface such as that described in U.S. Pat. No. 6,972,401 to Akitt et al. issued on Dec. 6, 2005 and assigned to SMART Technologies ULC, the contents of which are incorporated by reference. The bezel 26 provides